

REMARKS

Claims 1-3, 6, 7, 9, 11-16, 19, 22, 24 and 25 have been amended herein, and claims 8, 20, 21 and 26 have been cancelled herein. Claims 1-7, 9-19 and 22-25 are currently pending.

Amendments To The Specification

Pursuant to the Examiner's correct observation and objection, the paragraph beginning on page 8, line 11 has been amended herein to replace the reference numeral "36" to "56."

The paragraphs beginning on page 6, line 23, page 9, line 23, and page 10, line 4 have been amended to adjust terminology in a manner more clearly consistent with the invention as set forth in the amended claims. The amendments include replacing "emitter-detector" with "emitter-receiver" which is more clearly consistent with embodiments explained and depicted with reference to Figs. 4 and 5, and further include canceling a purported alternate embodiment that runs contrary to the intended inventive concept. No new matter has been added.

Claim Rejections Based On Prior Art

Claims 1-26 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,193,054, issued to *Henson et al.* (hereafter "Henson"), in view of Applicant's prior art depicted in Applicant's Fig. 3. Applicant respectfully traverses the foregoing rejections as they may apply to the claims as amended herein for the following reasons.

Independent claim 26 has been cancelled rendering its disposition moot. Regarding the grounds for rejecting independent claims 1, 13 and 14, Applicant agrees that in Figs. 2 and 2a, *Henson* discloses a detecting module in the form of a photocell (36) for detecting light that was interrupted by an object (A1-An) moving on a conveyor utilizing an optical component (36) when the object enters

a sensing zone; and b) a conditioning module (35) for conditioning the light to provide an output signal, which is utilized to provide routing control information to properly route the object as it is transported on the conveyor. The Examiner also correctly notes that it is known, as explained in Applicant's admitted prior art, to employ an optical emitter (70), and optical receiver (72), and an associated optical lens (64) in an optical conveyor sensor apparatus.

Regarding the grounds for rejecting claims 11 and 24, Applicant further agrees that *Henson* discloses connecting a plurality of optical components to a distributed controller insofar as the "components" in question are considered to be the components included within each individual photocell unit (i.e. the constituent components of a single photocell unit coupled to a corresponding photocell controller dedicated to an individual photocell and receiving no other signal inputs from other photocells).

Independent claims 1, 13 and 14 have been amended herein to more clearly distinguish and patentably define Applicant's proposed optical sensing method and apparatus from the subject matter disclosed by *Henson* and the other prior art. As depicted in Figs. 2 and 2A, the optical sensing apparatus disclosed by *Henson* is a physically distributed design in which each of the multiple photocell units $P_1 - P_n$ incorporates its own signal conditioning functionality including a photocell 36, a programmable controller 35, actuator assembly 32, timer 37, and a voltage source 56.

As explained on page 2, line 28 through page 3, line 2, and pg. 7, line 28 through pg. 8, line 18, Applicant's invention is directed to addressing the problem of redundancy and unreliability in conventional optical conveyor sensor systems, such as that depicted in *Henson*, in which control electronics including signal conditioning controllers are replicated at each zone-specific sensor module. As illustrated in Applicant's Fig. 3, such signal processing and control electronics included within each zone-specific module typically includes drivers, amplifiers and ASIC controllers dedicated to each photosensor unit.

Independent claims 1, 13 and 14 have therefore been amended to more clearly define a design in which a signal conditioning module provides centralized control and coordination of the sensor activity of individual emitter-receiver pairs. For example, claim 1 has been amended to recite, in part, a method for optically sensing the presence of an object on a multiple sensing zone conveyor comprising: “detecting light ... utilizing a plurality of emitter-receiver pairs ...”, and “receiving a signal corresponding to the detected light from each of said plurality of emitter-detector pairs at a signal conditioning module...”

The manner of individually accessing each of the zone-specific emitter-receiver pairs is also included in each claim which, for example, is recited in claim 1 as, “multiplexing the received signals to individually access each of the plurality of emitter-receiver pairs from said signal conditioning module.” Ample support for the foregoing amendments is set forth as described and depicted with reference to Fig. 4 (showing constituent emitter receiver components of “emitter-receiver pair”) and Fig. 5 (showing plurality of emitter-receiver pairs coupled to multiplexer/signal conditioning module).

As noted above, Henson does not disclose a centralized signal processing interface in which a centralized signal conditioning module receives, multiplexes and conditions the signals from each of a plurality of zone-specific photocells. Instead, and as clearly illustrated in Figs. 2 and 2A, *Henson* discloses a physically distributed photocell sensor design similar in principal to Applicant's prior art embodiment shown in Fig. 3 in which each photo sensor includes associated signal conditioning functionality in the form of a controller dedicated to each accumulation zone.

Since nothing in *Henson*, either alone or in combination with Applicant's stated prior art, or any other prior art known to Applicant, discloses or suggests a multi-zone conveyor type optical sensor method or system in which a signal conditioning module receives and multiplexes signals from a plurality of zone-specific emitter-receiver pairs as expressly recited in independent claims 1, 13 and 14, it follows that these claims and all claims depending therefrom are

patentably distinct from the prior art and a Notice of Allowance to that effect is respectfully requested. Applicants have diligently responded to the Office Action by pointing out with particularity how the claims clearly define and distinguish the proposed invention from the prior art, and furthermore invite the Examiner to contact Applicants at telephone number (505) 255-4536 if such communication would help to expedite the continued prosecution of the present application.

No extension of time is believed to be required in submitting this response; however, in the event that an extension of time is required, please consider that extension requested and please charge any required fee, as well as any other fees necessary to further the prosecution of this application, to the following Deposit Account.

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Respectfully submitted,

A handwritten signature in cursive script that reads "Kermit Lopez".

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